

Resúmenes en Inglés *English Abstracts*

Experimentation Environments for Teaching Basic Concepts on Automatic Control

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Abstract: This work presents two experimentation environments as part of educational project called AutomatL@bs. A brief description of both environments is given remarking the advantages on interactivity, virtual and remote labs, and web-based collaborative environments. Furthermore, the main teaching activities and tasks to perform with these environments are presented to be used in basic courses on modelling and control. Finally, some experiences, which have been done using these two environments, are analyzed and discussed. Copyright © 2010 CEA.

Keywords: virtual labs, experimentation environments, education, PID control, modeling.

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Integration of Several Devices into a Remote Control Laboratory Using Different Platforms: Labview, Matlab and C/C++

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Abstract: Remote control laboratories allow to work and made experiments with real physical devices that are located in remote environments. This equipment is accessible by students at any time and from anywhere with an Internet connection. In this paper a set of physical devices embedded within an overall scheme of remote laboratories (AutomatL@bs) is presented. By means of this remote laboratory the student can accomplish the experiments remotely. Special attention to the different possibilities of communication and interconnection between the interface and the physical device will be provided. The interface is made by means of Easy Java Simulations, so the direct connection between this and the physical devices located in remote laboratories will be analyzed. Copyright © 2010 CEA.

Keywords: Control Education, Remote Laboratory, Virtual laboratory, Remote control, PID control, Laboratory Techniques.

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Control Education: Application of ICT to Practical Activities through Internet

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Abstract: This paper describes the authors experience in applying information technology and communication teaching in automatic control. The development described here is part of the inter-university project "AutomatL @ bs". In this project seven universities have joined forces to share resources for experimentation through Internet in a flexible education. In particular, it explores the technical aspects necessary for the transformation of a traditional automatic control laboratory on a virtual and remote through Internet and related aspects of integrating these applications into a tool that supports flexible educational planning for educational purposes. Copyright © 2010 CEA.

Keywords: Automatic control, virtual and remote laboratory, flexible education, Internet.

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Application of Distance Laboratory System in Subjects of Automatic Control

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Abstract: The objective of this work is to suitably combine the hands-on and remote practices for teaching of control subjects. The use of Virtual and Remote Laboratories in Automatic education is more and more a resorted method by the universities to offer a flexible service in schedules and greater and better operation of the available resources. This paper show the implementation of remote practices for Regulación Automática I of the Universidad Politécnica de Madrid using the Distance Laboratory System (SLD) developed at the Universidad Central Marta Abreu de Las Villas. Copyright © 2010 CEA.

Keywords: control education, remote control, virtual laboratories, remote laboratories, real time.

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B.EN.DE.R. 3.0: Remote Robotic Platform for Teaching Innovation

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Abstract: During the last three academic years, the Basic ENvironment for DEveloping Robotic software (BENDER robotic platform) has been used in Concurrent Programming, (a subject lectured during the second year in the syllabus of the Computer Science Degree). From the first version to the third, several improvements have been made. This paper analyses these changes and shows how the robotic platform provides a new method to carry out the practical work in a real environment. A project for extending the capabilities of the system is also presented in order to get a better remote access method. Copyright © 2010 CEA.

Keywords: Concurrent Programming, Teaching Innovation in Automation, Real Time Systems, Robotics.

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Design of Virtual and/or Remote Laboratories. A Practical Case

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Abstract: In this article we carried out an analysis on the access forms to the experimental resources of a university laboratory (present or remote through Internet), as well as the own elements and/or systems to carry out the experiments, which can be virtual (simulated in a computer) or physical (traditionally used in the present practices). From here, we intend some design rules for laboratories of remote access with control of physical systems through virtual instruments. As practical case of application it is presented an educational project of investigation: the Laboratory of E-learning for Robots (LER) that focused to the teaching in Automatic, it is being carried out by professors, degree and postgraduate students at University of Huelva. Copyright © 2010 CEA.

Keywords: Education in Automatics, E-learning, Virtual Instrument, Remote Instrument, Remote Laboratory, Virtual Laboratory, Robotics.

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Virtual Lab for Simulation and Remote Monitoring and Control of a Drip-Irrigation System in Olive Groves

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Abstract: This article presents the development and application of a laboratory designed for simulating control and irrigation strategies that can be then applied in field, in a drip irrigation system installed in a pilot plant. The system presented in this work involves the development of a simulation software, the monitoring of different variables, and the remote control of a pilot plant. This article also describes other components of the system, such as the moisture sensor network, the communication network, and the remainder hardware required for the remote control. The laboratory as well as the pilot plant is installed in olive groves located in the province of San Juan, Argentina. Copyright © 2010 CEA.

Keywords: Laboratory education, computer simulation, remote control, in line control, supervisory control system, agriculture.

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Usage Experience of a Remote Control Laboratory

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Abstract: Remote laboratories showed significant progress during last years. Their integration in engineering education had their justification in solving many logistic problems inherent to conventional labs and their use entail a significant impact from the pedagogical point of view. This paper presents an experience use of a remote control lab, which is aimed at showing the remote experimentation scope from students' point of view as well as from the instructor perspective. Copyright © 2010 CEA.

Keywords: Control Engineering, Remote laboratory, Education.

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Virtual and Remote Laboratories for Signal Processing

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Abstract: In this paper, virtual and remote laboratories for signal processing are presented. Computational tools that can be used in virtual laboratories or in a remote way via an Internet connexion have been developed. It is proposed to use these tools in several subjects at university level of education, in the degrees of Physical Sciences, Electrical Engineering and Informatics. Some of the experiences can be carried out with real system by using a DSP. Students can visually test the results or even by hearing the audio signals. These tools can motivate the student in their study and help them in their learning. Some results of the effect of the application of these virtual and remote labs at the University Complutense of Madrid are discussed. Copyright © 2010 CEA.

Keywords: Virtual labs, remote labs, education, signal processing, automatic control.

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Web-LABAI: Remote Laboratory in Industrial Automation

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Abstract: This paper presents a remote laboratory with facilities that allow students to interact and perform, via Internet, experiments in automation and process control. It proposes a Hardware-Software system which allows monitoring and controlling, through a website, a prototype of an industrial process implemented at the Industrial Automation Laboratory of the Department of Electronic Engineering at the UNEXPO "Antonio Jose de Sucre", at Barquisimeto, Venezuela. The interaction of a Server computer, a Programmable Logic Controller or PLC and an IP camera allows the monitoring and controlling of a concentrated food maker prototype remotely. The software has two applications: the Server and the Client; the first being composed of an embedded Modbus TCP/IP Server into the PLC and a Web server which allows students to access the remote laboratory. The second component is integrated by a group of Java applets to control and monitor the system and also allows the students to visualize real time images through an IP camera. Copyright © 2010 CEA.

Keywords: Automation, remote laboratory, Programmable Logic Controller, Real time control, Educational aids.

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